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BUSINESS TRENDS IN OREGON, SEPTEMBER 1957

(See pp. 7-8 for statistical details)

• **Bank debits** in the eleven economic areas of Oregon were down 1.9 per cent in September compared with the same month last year. Largest change was recorded in the Upper Columbia River area, a decrease of 15.7 per cent. Compared with last month, total bank debits were down 7.3 per cent.

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• **Lumber production** in the Douglas fir region of the Pacific Northwest was down 4.0 per cent in September compared with last month and down 15.1 per cent compared with September 1956. Inventories were down by 0.3 per cent and unfilled orders were down by 6.8 per cent from the same month a year ago.

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• **Employment** in nonagricultural industry increased by 0.3 per cent in September compared with last month's total, but decreased by 2.1 per cent compared with the same month last year. The lumber industry, with a decrease of 12.5 per cent (11,000), registered the largest change from its year-ago level.

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• **Average weekly earnings** of production workers in manufacturing industries in Oregon decreased 5.5 per cent in September compared to August.

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• **The index of man hours worked in manufacturing** (1951 = 100) fell to 92.0 per cent in September compared to 101.3 in August and 108.7 in September 1956.

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• **Construction contracts** awarded in August were down 28.6 per cent compared to the previous month. The total value to date was unchanged from the first eight months of last year. Residential construction was down by 7.2 per cent.

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• **The value of building permits** issued in September was down 13.8 per cent from August 1957 and down 22.8 per cent from September 1956.

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• **Agricultural income,** as indicated by cash receipts from crop marketing, was unchanged in July 1957 compared to July 1956. To date agricultural income is running 2.2 per cent above last year.

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• **Business failures** in September 1957 involved a 33.4 per cent decrease in total liabilities compared to last month's total of $1,024,000. Total 1957 failures to date were 372 compared with 176 for the same period last year.

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• **Department-store sales** in Portland fell 11 per cent in the four weeks ending October 5, compared with a national decline of 1 per cent.

River Basin Development Vital for Economic Growth of Northwest*

By JAMES N. TATTERSALL
Instructor in Economics, University of Oregon

In spite of the growth of income, population, manufacturing, and other relevant indicators in the past twenty years, the qualitative economic problems of the Pacific Northwest[1] are still surprisingly similar to those noted by the National Resources Planning Board in their investigations of the 1930s—heavy dependence on a relatively inelastic resource base, seasonal unemployment, and industrial growth limited by distance from major markets and small regional population and income.[2]

The NRPB believed that substantial economic growth could be induced by development of the Northwest's third great resource (besides agriculture and the forest), the hydroelectric and irrigation potential of the Columbia River and its tributaries. The recent declining rate of economic growth in the Pacific Northwest has brought about renewed interest in this avenue of industrial development. This paper will examine the contribution of river-basin planning to regional economic growth in the past twenty years, evaluate the problems of promoting economic development by this means, and discuss the requirements which would have to be met to achieve further industrial growth based on hydroelectric resources. First, some salient features of the regional economy will be outlined:

(1) Since 1910, growth of population and income in the Pacific Northwest has been at or below the national rate of growth except during the two world wars and the depression period, when regional growth was stimulated by heavy Federal expenditures.[3] The region's growth pattern has been in strong contrast with that of California, a state which has expanded rapidly under private as well as governmental stimulus during the periods (the 1920s and 1950s) when the Northwest was, relatively, declining. A greater variety of rich natural resources, including climate, mainly account for the differential growth rates of California and the Pacific Northwest.[4] The different experiences of the two areas illustrates the fallacy of lumping them together in a single "Pacific Coast" region, as is frequently done in governmental publications and elsewhere.

(2) Diversified industrial growth since 1940 (most of it directly related to Federal expenditures) has been largely confined to the

* A paper read at the Western Economic Association annual meeting, Salt Lake City, Aug. 29, 1951.

[1] The region as defined in this paper consists of the three states of Washington, Oregon, and Idaho, except where western Montana is specifically mentioned.

[2] See U. S. National Resources Planning Board, *Pacific Northwest Region: Industrial Development* (Washington, 1942), and earlier publications of this organization.

[3] See Paul B. Simpson, *Regional Aspects of Business Cycles*, Eugene, Ore., 1953), pp. 59-68. Simpson, "Factors in Oregon's Relative Income Decline Analyzed," *Oregon Business Review*, Mar. 1957, and Daniel L. Goldy, *Labor Force Trends in the Pacific Northwest and their Relation to Resource Development*, have analyzed the recent relative decline in regional per capita income and employment growth.

[4] Margaret Gordon, *Employment Expansion and Population Growth: The California Experience, 1900-1950* (Berkeley, 1954), is the outstanding study of the growth of the California economy.

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state of Washington. The manufacturing sector of Oregon's economy bears, in fact, a strong resemblance to that of Washington in 1929, except that employment in the various metals industries is about 5,000 greater.

(3) The widespread belief that the Federal government makes a greater than average contribution to regional income is correct only for the state of Washington. Since World War II, Federal income disbursements (which comprise about 30 per cent of all Federal expenditures) have provided a smaller share of the income of Oregon and Idaho than of national income. The 1955 ranking of the states in terms of Federal income disbursements as a percentage of personal income was Washington 11th, Idaho 29th, and Oregon 37th.[5] The region's military installments and defense contractors are also heavily concentrated in Washington state. The differential contribution of the Federal government can be explained by geographic, site, and economic factors, such as the greater hydroelectric potential of Washington state and the managerial and engineering enterprise of the Boeing aircraft company.

(4) An appraisal of the future prospects of the region, while obviously hazardous, gives little reason to anticipate, in the next five or ten years, a rate of growth appreciably greater than that of the recent past. Table 1 indicates the dominant role in postwar growth of the aircraft industry in Washington and the lumber industry in Oregon. The growth of the Boeing company since World War II has constantly baffled prediction: employment in 1957 was 63,500, compared with a World War II high of 44,000 and a postwar low of 10,000. It appears the transfer of B-52 production to Wichita will be offset to some extent by increased production of the Bomarc missile.[6] While the Boeing company produces civilian aircraft, has been extremely active and successful in research and development and in competition for defense contracts, it seems unlikely that its rate of growth in the Northwest will continue to approach that of the past ten years. The situation in Oregon is roughly similar; the Pacific Northwest Forest and Range Experiment Station anticipates in its 1956 Annual Report an expansion of lumber production in Oregon of about 6 per cent for the period 1955-65, compared with 25 per cent for the period 1945-55, and a 25 per cent expansion of plywood production compared with about 500 per cent in the earlier period.[7] An anticipated 80 per cent expansion in pulp production is slightly greater than the expansion which occurred in 1945-55. While there are good prospects for growth in the pulp and paper and chemical industries, and for small gains in a variety of industries oriented to the regional market, the Northwest does not yet appear to have reached the stage of self-generating growth based on an expanding regional market reached by California in the 1920s. There has been some growth in market-oriented industry (notably petroleum refining) in the past decade, but it has provided only a small fraction of the total increase in employment.

This all-too-brief survey indicates that, if attainable, industrial growth induced by further development of hydroelectric resources could make a valuable contribution (1) in bringing the western part of the region closer to the population and income "threshold" beyond which an increasing amount of industrial growth oriented to the regional market would be generated, and (2) in adding diversity and stability to those eastern sections of the region which must be expected for the foreseeable future to remain heavily resource-oriented in their economic structure.

TABLE 1. GROWTH IN EMPLOYMENT IN BASIC INDUSTRIES, 1947-56*

	Washington	*Oregon*	*Idaho*†
All manufacturing	33,800	14,300‡	3,500
Lumber	–8,500	6,800	1,500
Metals	7,600	3,700	700
Aircraft	30,800	.....	.....
Shipbuilding	–1,800	§	.....
Food	–5,700	.....	–200
Pulp & paper	4,100	2,200	600
Chemicals	3,000	§	800
All other mfg.	4,300	1,600	100
Agriculture	–8,500	–6,500	§
Mining	–1,000	.....	–1,000

* Sources: Washington State Employment Security Department; Oregon State Unemployment Commission; Employment Security Agency, State of Idaho; and Bureau of Business Research, University of Washington, *Federal Expenditures in Washington* (1956).

† Estimates for Washington and Oregon are annual averages. For Idaho, the period covered is Apr. 1947 through Apr. 1955 (covered employment only).

‡ For the period 1946 through 1956, the increase in Oregon manufacturing was 24,500, and in the Oregon lumber industry 16,600.

§ Data not available.

Residents of the Northwest have not always had a clear view of the nature of the attractive potential of electric power for industry. For most industrial products the cost of power is a small fraction of selling price, so that reliability of supply of electric power is a far more influential factor in industrial location than its cost.[8] The cost of power is significant, however, to the electroprocess industries, so called because they use large amounts of power in the production process. These industries include light metals (power cost has been estimated at 6.3 per cent of the selling price of aluminum at 2 mills, 12.6 per cent at 4 mills[9]), ferroalloys, and a variety of chemical products. They are characterized by a low ratio of employment to power use, a fact which has frequently been used for questioning their advisability as generators of regional growth. Electroprocess industries, however, have offsetting advantages: they are in a period of rapid secular growth and are seasonally stable, high-wage industries. In many cases they are associated with higher-labor-using mining, semifabricating, and fabricating operations, though a completely vertically integrated operation is unlikely to occur in a region in the early stages of industrialization.

[5] U. S. Department of Commerce, Office of Business Economics, *Personal Income by States Since 1929* (Washington, 1956), pp. 205-06.

[6] Seattle *Post Intelligencer*, Aug. 14, 1957, p. 1.

[7] Pacific Northwest Forest and Range Experiment Station, *1956 Annual Report*, pp. 16-18.

[8] Edwin J. Cohn, *Industry in the Pacific Northwest and the Location Theory*, (New York, 1954), pp. 118 ff.

[9] Ivan Bloch and John H. Davidson, "Some Industrial Aspects of U. S., Pacific Northwest and Alaska Power," Paper presented at meeting of the American Institute of Chemical Engineers, Seattle, June 10, 1957, p. 8.

Federal development of the Columbia River system has produced the nation's lowest power rates. The advantages of Federal development are not confined to lower capital costs and freedom from state and local taxes. Under Federal development the entire region can be regarded as a planning unit, nonpower purposes can be incorporated into projects to a greater extent than ever attempted by local utilities, economies of scale beyond the resources of local utilities can be achieved,[10] and projects can be built on the basis of less certain predictions of a market for power. These advantages are accentuated by the physical characteristics of the Columbia River Basin, full development of which demands very large hydroelectric installations, including upstream storage reservoirs in Canada, Idaho, and Montana, to generate power both at site and at downstream plants in Washington and Oregon, requiring hydraulic and electrical integration of the projects in a single regional system. (The Northwest Power Pool, consisting of Federal, local public, and private utilities, achieves economies in operations but has no connection with project construction.)

The ability of the Federal government to produce large quantities of low-cost power ahead of normal market demands has been the means of attracting electroprocess industries to the Tennessee Valley and the Pacific Northwest. Efforts to promote industrial development by these means have, however, operated under the handicap of a low priority assigned to it by the institutional framework of American society. In the first place, Federal generation and marketing of power has never enjoyed the same widespread public acceptance as other government policies influencing the location of industry, such as the navigation and irrigation phases of river-basin development. Multipurpose projects have frequently been sponsored and introduced as primarily irrigation or navigation projects, with power as an incidental purpose, even where the major benefits to the region derived from the hydroelectric power produced. Second, Federal power marketing policy has assigned higher priority to objectives other than industrial development. The Bonneville Power Administration Act, for example, directed the administrator "to encourage the widest possible use of electric energy" and to operate the projects "for the benefit of the general public and particularly of domestic and rural consumers," giving preference and priority at all times to public bodies and cooperatives.[11] Accomplishment of these objectives is indicated by an increase in per capita consumption of electric energy of 285 per cent in the Pacific Northwest in the period 1938-51 compared with an average national increase of 180 per cent, and by the practically complete extension of urban and rural electrification in the Northwest.[12] The development of the electroprocess industries in the Northwest has been through the fortuity of a series of emergency situations rather than through a process of deliberate long-range planning.

Availability of large blocs of low-cost power has been a major factor in the location of a number of industries in the Pacific Northwest since 1940. Of these, the aluminum industry is the heaviest power user; its 1955-56 purchases of 9.2 million kilowatt hours from the Bonneville Power Administration compared with total regional consumption of approximately 40 million kwh.[13] The three major aluminum companies employed in 1956 approximately 10,000 workers in Washington and 1,000 in Oregon.[14] Approximately 1,000 more will be added with establishment of the Harvey Aluminum Co. in Oregon. About 7,000 of the total are employed in aluminum reduction facilities and 4,000 in semifabricating. Since World War II a large number of small firms engaged in fabrication of aluminum products have been established in the region, particularly in Washington; since a number of these firms are engaged in fabrication of various metals, it is difficult to determine the precise employment attributable to aluminum fabrication, but it is probably in the region of 1,000.

Most of the United States aluminum semifabrication facilities are located in the East and Middle West; this stage of aluminum production is not heavily dependent on power; and freight rates per ton on fabricated aluminum are much greater than on aluminum ingot. The delivered pricing structure of the industry also tends to encourage present locational arrangements.[15] The original expansion of reduction facilities during World War II was based on surplus power from the Bonneville and Grand Coulee projects; but since 1947 there has been little firm power available for electroprocess industries and the expansion which has occurred since that date has been based very largely on interruptible power which is cut off at times of low stream flow.[16] In 1956, 43 per cent of Kaiser's power requirements were met by interruptible power.[17]

At the time of the Korean War expansion of this industry, the Pacific Northwest had a cost advantage over its then nearest competitors, the Gulf Coast and the Tennessee Valley, but received only 29 per cent of the additional capacity in Washington and Oregon plus 7 per cent in Western Montana; in addition to nonavailability of firm power in the Northwest, accelerated depreciation privileges favoring construction of industry-owned power facilities may have been a factor in the establishment of most of the new capacity in the Gulf Coast region, based on supplies of natural gas.[18] Since that time, the rising price of natural gas has precluded further expansion on the Gulf Coast, but the aluminum companies have contracted to purchase steam-generated power in the Ohio Valley at prices reported as slightly over 4 mills.[19] The cost of power to one Ohio Valley

[10] Grand Coulee's installed capacity of 1,944,000 kilowatts compares with the 336,400 kilowatts of the largest (as of 1955) single United States private utility hydroelectric project. U. S. Federal Power Commission, *Statistics of Electric Utilities in the United States* (Washington, 1955).

[11] Charles McKinley, *Uncle Sam in the Pacific Northwest* (Berkeley, 1952), pp. 161-162.

[12] Endel J. Kolde, *Energy Base of the Pacific Northwest Economy* (Seattle 1954), p. 12, and Cohn, *op. cit.*, p. 113.

[13] U. S. Bonneville Power Administration, *The U. S. Columbia River Power System* (Portland, 1956).

[14] Employment figures for specific electroprocess firms were obtained from state directories of manufacturing firms.

[15] Fremont E. Kast, "Manufacturing Growth in the State of Washington, 1939-54," doctoral dissertation, University of Washington (1956), p. 373.

[16] Firm power is that which is available under the most adverse water conditions contemplated.

[17] U. S. Senate, 84th Congress, 2nd Session, *Upper Columbia River Development*, Joint Hearings before the Committee on Interior and Insular Affairs and a Special Subcommittee of the Committee on Foreign Relations, Mar. 22, 26, 28, and May 23, 1956, p. 172 (hereafter refered to as *Upper Columbia River Development*).

[18] John V. Krutilla, "Locational Factors Influencing Recent Aluminum Expansion," *Southern Economic Journal*, XXI (1955), 273-288.

[19] *Wall Street Journal*, "Kaiser Aluminum Announces $280 Million Expansion," Dec. 5, 1955.

plant is in fact reported as about 3.5 mills.[20] At the BPA rate of $17.50 per kilowatt year, power is available at 2 mills at 100 per cent load factor, though the average price paid by electroprocess industries has been about 2.2 mills. A rate of $14.50 is available within fifteen miles of the dam sites.

The Northwest must bear a regional transportation cost differential on regional imports of alumina and on ingots shipped to Eastern and Midwestern rolling mills, which is estimated by BPA and aluminum company officials as the equivalent of a power price differential of approximately 1.7 mills per kwh. This differential would vary with the plant locations of individual firms. The Pacific Northwest had 35 per cent of national aluminum reduction capacity after the Korean War expansion (565,000 tons out of 1.6 million); this proportion will be reduced to approximately 28 per cent after the present expansion phase to 2 million tons is completed in 1958.[21]

Kaiser Aluminum and Chemical Corp. forecasts anticipate a further expansion to 4.2 million tons by 1965, while the more conservative estimate of the President's Materials Policy Commission is for domestic production of 4.5 million tons by 1975, about 3.6 million to be provided by primary aluminum production and the remainder from scrap metal.[22] While at the present time the Northwest would appear to be still in a competitive position to obtain a share of this increased capacity, in the event generating facilities could be made available, rising transport costs and innovations reducing the input of power in the reduction process could impair its position in the next few years.

A number of additional electroprocess industries with total employment of approximately 2,000 have entered the region since 1940, including plants producing chlorine, abrasives, calcium carbide, elemental phosphorus, and ferroalloys. (This estimate does not include such moderate power users as steel and copper.) Most of these plants purchase power directly from BPA. While cost and availability of electric power was an important factor in their location, other factors, such as the growth of the Western market and the presence of raw materials in the region, were important in some cases.[23]

Availability of large blocs of power from BPA was one of several factors influencing the location of the Hanford Atomic Works in eastern Washington; other factors were the isolated location and large volumes of cold river water to carry away heat from the graphite piles. Employment in Hanford operations has grown to over 9,500 and comprises 75 per cent of employment in Washington's chemical industry, while construction employment in the postwar period has varied from a few hundred to more than 15,000.[24]

Construction of the Hungry Horse Dam and reservation of a share of its power to the state of Montana has induced employment of approximately 1,000 in an aluminum reduction plant and an elemental phosphorus plant.

On the irrigation side, the principal project associated with Federal development of the Columbia River is the Columbia Basin Reclamation Project in central Washington; 176,000 acres were under cultivation in 1956; 600,000 are planned by the early 1960s; the eventual total will be 1,029,000 acres. Various estimates indicate the population increase (farm and nonfarm) attributable to the currently approved 600,000-acre program will be approximately 80,000 to 90,000.[25] On the basis of the ratio indicated by these estimates, the population increase attributable to Bureau of Reclamation irrigation projects in the Pacific Northwest since establishment of the agency in 1902 would be between 145,000 and 160,000 (1,070,000 acres had received full irrigation up to 1956).[26] Some additional population increase would be expected from supplemental irrigation by the Bureau of 1,204,000 acres, because of increased incomes from the affected farms.

A complete evaluation of the regional impact of river-basin development would have to take into consideration the employment impact of construction of the projects and of the induced industrial facilities. On the basis of data available for the Grand Coulee and Priest Rapids projects, an average of approximately 5,000 construction workers must have been employed in dam construction since 1933.

The aluminum, atomic energy (plutonium), electrochemical, and electrometallurgical industries employed in 1954 about 7 per cent of the Pacific Northwest's manufacturing workers. More significant as a measure of their impact on the regional economy, they provided between 1939 and 1954 15 per cent of the increase in regional manufacturing employment during that period. For the state of Washington the comparable figures are 11 per cent of the manufacturing work force and 24 per cent of the 1939-54 increase.[27]

The hydroelectric potential of the Pacific Northwest is approximately 35 million kilowatts of installed capacity.[28] Of this potential 85 per cent is in the Columbia River and tributaries. Some of the potential capacity would produce power at higher cost than alternative methods of generation, and the economically and practically developable potential is about 19-22 million kilowatts of installed capacity and about 14 million kilowatts of prime power.[29] (This compares with the 3.2 million kilowatts of hydroelectric installed capacity in the now completely developed TVA

[20] *Congressional Record*, June 3, 1957, p. 7326.

[21] See *Wall Street Journal*, Dec. 5, 1955.

[22] Bert Inch, "Aluminum's Future," *Modern Metals*, Dec. 1956, pp. 62-65, and *Resources for Freedom*, II (1952) 67.

[23] Cohn, *op. cit.*, pp. 134-143.

[24] Bureau of Business Research, University of Washington, *Federal Expenditures in Washington* (1956), pp. 43-47.

[25] See Herbert E. Simison, "Washington's Newest Agricultural Frontier—The Columbia Basin Project," *Pacific Northwest Business*, Jan. 1957, pp. 5-11, and M. E. Marts, *Population and School Enrollment Forecasts*, University of Washington (mimeographed).

[26] Information obtained from U. S. Reclamation Bureau, Boise, Idaho.

[27] The initial expansion of these industries is responsible, of course, for increased employment in such areas as trade, services, and transportation. Roland E. Miller, "The Impact of the Aluminum Industry on the Pacific Northwest: A regional Input-Output Analysis," *Review of Economics and Statistics* XXXIX (1957), 200-209, calculates 0.6 other jobs were created for each new aluminum-industry job in the Pacific Northwest in the period 1939-47. It seems doubtful if the indirect effects of the initial aluminum expansion had completely worked themselves out by 1947; studies of the aluminum industry for a later date and of other electroprocess industries, especialy those utilizing local raw materials, might be expected to indicate a somewhat higher "employment multiplier." The Stanford Rsearch Institute study, *The Impact of the Aluminum Industry on the Economy of the Pacific Northwest*, does not measure the employment multiplier, but the entirely different concept of regional employment (and population) due to production *and consumption* of aluminum.

[28] *Upper Columbia River Development*, pp. 254-273.

[29] National Resources Planning Board, *op. cit.*, p. 33; U. S. Army Corps of Engineers, *Information Bulletin*, June 9, 1956; U. S. Federal Power Commission, *Future Power Requirements, Pacific Northwest* (mimeographed, 1956); verified by independent estimate of the writer.

system.) By June 1956, 7.5 million kilowatts had been developed (about 5 million kilowatts of prime power).[30] Of the 6 million kilowatts added since 1935 70 per cent has been Federally constructed; on completion of projects now under construction, Federal investment in the Columbia River system will be about $2.5 billion.

The rate of construction of new generating capacity, while adequate to supply the rapidly increasing "normal" or "incremental" load growth, has, since 1947, been insufficent to supply the potential electroprocess or "developmental" load growth. Until 1956-57, projections of load growth and scheduled additions to generating capacity indicated that shortages even of normal power requirements loomed only a few years ahead, and that drastic curtailments of BPA deliveries to privately owned (nonpreference) utilities would have to be made under critical water conditions. On several occasions during World War II, the War Production Board overruled BPA's requests for additional generating capacity, including immediate construction of the McNary, Hungry Horse, and Chief Joseph projects; during part of the war needs were met by overloading the generators.[31]

The 1950 BPA Advance Program indicated that no firm power could be made available for new electroprocess loads until the mid-1950s, with the exception of the power allocated to the state of Montana from the Hungry Horse project. BPA's proposed Schedule "S" would have provided substantial reserves for electroprocess expansion by about 1957-58, but Congressional appropriations were not forthcoming to maintain this schedule. Schedule "S" recommended completion of the Lower Snake River projects and the Hells Canyon project between 1957 and 1960; these projects would have added 1.8 million kilowatts of installed capacity to the Federal system. During the postwar period, many applications from aluminum companies and other electroprocess industries for firm power have had to be rejected by BPA.[32] From published information available, it appears the present electroprocess load served by BPA could have been doubled.[33]

After the change in national administration in 1953 and the announcement of a Federal power policy encouraging greater local participation in river-basin development, there was a veritable landslide of filings on hydroelectric sites by local private and public utility systems. Construction plans of these agencies have pushed looming power shortages several years into the future; the 1955 BPA Advance Program estimated load growth would exceed resources by 1961-62, while the 1956 Program estimated the shortage would occur (in the absence of further construction) in 1964-65.

The partnership policy proclaimed in 1953 has been virtually inoperative, since no partnership projects having a significant Federal contribution have been authorized by Congress.[34] Nearly all Columbia River system projects (except the Willamette Valley projects, and including even the major upstream storage plants) have over 70 per cent of their cost allocated to power, so that the usual type of partnership project, involving Federal payment of nonpower costs only, would require a small percentage share of Federal funds. Local construction, rather than partnership, has therefore been the rule for new projects started since 1953.

This policy is not without its disadvantages. It will result in higher power costs to users as a result of the higher capital costs of projects constructed by the local agencies. Local construction has typically involved a reduction of nonpower benefits, as in the elimination of 1.5 million acre feet of flood-control storage at the Priest Rapids site. Of greatest long-run significance, however, is the lack of progress made in achieving the flood-control and power-storage objectives of the Corps of Engineers 1948 main control plan, calling for 27 million acre feet of usable storage, 21 million acre feet to be used to control the largest flood of record (1894), and recommending immediate construction of a number of projects which would have achieved this goal. At the present time there is in existence only 10 million acre feet of upstream storage, 4.9 million acre feet usable for flood control. The additional storage required to achieve the main control objective would reduce average annual flood damage in the lower Columbia River flood plain from $12 million to $3 million a year and would increase the prime power output of downstream plants by several million kilowatts.[35] Preliminary estimates indicate that Federally generated steam power, in combination with the system's secondary power, could product firm power saleable at about 4 mills,[36] substantially higher than the estimated cost of system firm power using 25-30 million acre feet of upstream storage and leaving the flood-control objective unfulfilled.

At least eight potential major upstream storage sites, with 23 million acre feet of usable storage, are under serious opposition from mining, fishing, agricultural, and wildlife interests, and the Libby project (5.1 million acre feet) is delayed pending outcome of international negotiations. Adding to the difficulty of achieving storage objectives, the Federal Power Commission has recently issued licenses or permits for privately developed projects providing substantially less power and flood-control storage than the alternatively proposed Federal projects (Hells Canyon, Nez Perce, and Paradise).[37] In all, over 32 million

[30] U. S. Bonneville Power Administration, *1956 Advance Program*, Table 1.

[31] McKinley, *op. cit.*, pp. 175-177.

[32] Cf. BPA *1950 Advance Program*, p. 23; Cohn, *op. cit.*, p. 126; U. S. Federal Power Commission, In the Matters of Idaho Power Co., Project No. 1971, No. 2132, and No. 2133, *Transcript*, pp. 14825-26 (Testimony of Samuel Moment).

[33] This would have involved most of the Korean War aluminum expansion, electrochemical production, potential new entrants into the aluminum industry, and production of furnace-grade Idaho phosphates; (see U. S. Bonneville Power Administration, *Estimated Potential Electric Power Requirements of the Snake Basin Area* (1952), pp. 29-31.

[34] Efforts of the national administration to have the Cougar, Green Peter-White Bridge, and John Day dams authorized as partnership projects have failed in Congress, and these projects will apparently be constructed as entirely Federal projects, though to date little more than token amounts have been appropriated for them.

[35] *Upper Columbia River Development*, pp. 44, 75.

[36] PUD No. 2 of Grant County, Wash., *Priest Rapids Hydroelectric Development, Columbia River, Washington*, IV, Power Markets and Transmission Report (June 1955), p. IV-C-31 and ff.

[37] The reasons given by the FPC for licensing the three-dam Idaho Power Co. project in the Hells Canyon reach of the Snake River were not that the Federal high dam would be an economically inferior project but that there was little prospect for Congressional authorization of the high dam (particularly emphasized in the examiner's *Decision*, pp. 55-56) and that the three-dam project would provide power to alleviate more quickly the anticipated power shortage in the Snake River Basin. (*FPC Opinion No. 283*, p. 17). The FPC staff evaluated the high dam and the three low dams on the hypothetical basis of Federal financing for each. They used four alternative methods of arriving at the benefit-cost ratio of the extra

acre feet of usable storage is under opposition from local interests or apparently eliminated by the FPC decisions. While the physical storage potential of the United States portion of the Columbia Basin is estimated as 61 million acre feet,[38] the projects under opposition (or eliminated) are the largest and lowest-cost potential sites.[39] The Assistant Chief of Engineers for Civil Works, United States Army, has stated, "We are having the greatest of difficulties in getting additional storage any place in the basin."[40] The list of hydroelectric projects under construction, scheduled, or under active consideration in the BPA 1956 Advance Program (Table 6) would, according to BPA, "substantially complete development of the power head on the Columbia River and its main tributaries in the United States." Yet the list includes only 4 million acre feet of United States storage which would be usable in controlling lower Columbia River floods and increasing the prime power output of the plants on the Columbia and the Snake (i. e., that would contribute toward the objectives of the main control plan). Even with addition of the Libby (international) project to this list, the objectives of the main control plan could not be achieved.

Attention has increasingly focused on upstream storage in Canada as a solution to these problems. One-third of the discharge of the Columbia River originates in Canada. The Libby, Mica Creek, and Arrow Lakes projects would provide 19 million acre feet of usable storage and, if simultaneously added to the existing system, would contribute 855,000 kilowatts of at-site prime power plus 1,358,000 kilowatts of prime power at downstream plants in the United States, besides providing substantial flood-control benefits.[41] The largest of these projects, Mica Creek, would develop a substantial part of Western Canada's hydroelectric potential and provide the basis for industrial development similar to that which occurred in the state of Washington with the construction of Grand Coulee and Bonneville. On a first-added basis, the Mica Creek project, with 10.5 million acre feet of storage, would produce about 700,000 kilowatts of prime power at-site and contribute 1,076,000 kilowatts to downstream plants (739,000 if Libby and Arrow Lakes were constructed simultaneously—the amount would decrease somewhat further with construction of United States storage, but the difficulties there have been noted). Seven hundred thousand kilowatts of prime power is contemplated from the Downie Creek and Little Dalles projects, several miles downstream, to be added later, and an additional 700,000 kilowatts of prime power would be developed downstream with further construction on the main stem of the Columbia.[42]

There is a question whether the downstream contribution of Mica Creek will be made in the United States or in the Fraser River in Western British Columbia. A proposed diversion of 15 million acre feet from the Columbia to the Frasier through the Monashee Mountains would have a seriously detrimental effect on future development of the Columbia River in the United States, and the possibility of making this diversion enhances the Canadian position in international bargaining over division of prospective power benefits. It is probable that, as a part of any international agreement, some part of the downstream power benefits of the Canadian projects would have to be returned to Canada by long-distance transmission. Anticipated completion by 1958 of the Canadian investigations of these projects and the Corps of Engineers review of its 1948 "308 Review Report" should provide the basis for settlement of this vital question.

BPA and FPC studies indicate that, about 1975, the cost of additional hydroelectric generation in the Northwest will be about equal to the expected cost of power generated by steam or atomic energy.[43] Virtually all the electric energy generated after this date would be from these alternative sources, and by 1985 or 1990, only 50 per cent of the Northwest's power is expected to be hydroelectric. More recent revisions of load-growth estimates have brought this date forward at least two years.[44] At the present rate of additions to the system of 750,000 kilowatts per year, the output of the prospective projects listed in the 1956 BPA Advance Program would be absorbed by the regional load growth by 1972: failure to obtain Canadian or American upstream storage would in fact require considerable steam generation in the 1960s, to firm up the large amounts of secondary energy generated. The above estimates do not take into account 900 billion kilowatt hours of potential electroprocess loads, exclusive of aluminum, which BPA estimates might materialize by 1966 (1.2 million kilowatts at 80 per cent load factor).[45] If the ratio of employment to power use of these industries were to be the same as in the miscellaneous electroprocess industries presently in the region, these new plants would provide employment for approximately 13,000 workers.

The recent wave of filings by local agencies has still left a backlog of projects, including John Day, the Lower Snake River plants, and Libby, which have been authorized by Congress for Federal construction. Storage projects in Canada or the United States would also substantially increase the output of the Federal system. None of these potential projects are included in the BPA estimates, which foresee an approximate equality of load growth and resources by 1964-65 and deficits thereafter. Hydroelectric projects have a gestation period of four to seven years (Mica Creek has been estimated as high as ten), and there is therefore little prospect of surplus firm power being

power produced by the high dam. The average of these ratios was 1.07. The FPC opinion concluded that the power features of the one-dam plan had no clear economic advantage. The examiner's decision pointed out that the high dam would have substantially greater indirect benefits (not calculated in the staff's cost-benefit computations) than the three-dam project, particularly in stimulating phosphate and mineral development (pp. 65-66). The Idaho Power Co. argument that the high dam was economically infeasible is based primarily on a capital-cost estimate for the three-dam project $53 million lower than the estimate of the FPC staff expert, supported by a firm offer of the construction company. This offer was not accepted by the examiner for reasons stated in *Decision*, pp. 16-19. Had Bureau of Reclamation estimates of cost and other features of the projects been used, the economic advantage of the high dam would have appeared much greater than indicated above.

[38] *Upper Columbia River Development*, p. 234.

[39] M. E. Marts has suggested a number of measures for achieving agreement with local interests, including low at-site power rates to attract industry. "Up Stream Storage Problems in Columbia River Power Development," *Annals of the Association of American Geographers*, XLIV (1954), 43-50.

[40] *Upper Columbia River Development*, p. 91.

[41] *Ibid*, pp. 46-47.

[42] *Study of Development of Upper Columbia River Basin, Canada and United States*, Report to the Chairman of the Senate Committee on Interior and Insular Affairs Submitted by Senater Richard L. Neuberger, Dec. 15, 1955, (Washington, 1955), pp. 38-39.

[43] *Upper Columbia River Development*, pp. 150-151.

[44] Cf. *Upper Columbia River Development*, p. 141, and BPA *1956 Advance Program*, Table 3.

[45] BPA *1956 Advance Program*, pp. 15-16.

available before 1964-65, though the region would benefit from the construction involved. The writer's comparison of estimates of load growth and resources for the 1960s indicates that, if the projects listed above plus Canadian or United States upstream storage, were to be completed during the period 1964-69, one to two million kilowatts of power could be made available to electroprocess industries.[46] This estimate assumes that between 25 and 50 per cent of the output of these projects could be used for electroprocess load and the rest for incremental load growth. While the estimate may be affected by change in load growth, local utility construction plans, and other factors, it does indicate roughly the magnitude of the effort required. Such a program would require a Federal investment of about $150 million a year over a ten-year period, exclusive of financial arrangements which might be made with Canada, or cost of United States upstream storage. This compares with $133 million appropriated for water-resources development in Washington and Oregon for fiscal year 1957, though the average for the past few years has been about $100 million. Power costs for the residential and commercial electric power consumers of the region would begin their inevitable rise one or two years earlier than if no electroprocess load growth were to occur.

The effect on BPA rates of additions to the Federal system is extremely relevant. Comparison of power output with estimated construction cost of Libby and Mica Creek indicates they are among the more economical storage projects in the Columbia Basin.[47] It has been estimated that John Day could possibly be added to the Federal system without significant impact on the BPA rate structure.[48] The Lower Snake River plants appear higher cost, but their economic feasibility would be materially enhanced by provision of storage upstream on the Snake River.[49] It has been estimated that the cost of saleable firm power produced by the phase C-2 system (which is comparable to the expanded Federal system indicated above with the possible substitution of Canadian for United States storage) would be 2.25 mills at 100 per cent load factor;[50] and the Corps of Engineers "308 Review Report" estimated that a 25 per cent upward revision of BPA rates would "pay out" 10 million additional kilowatts of construction on the Columbia River and tributaries.[51] These scattered indications at least indicate the advisability of a more comprehensive study, including the impact of increased interest rates on Federal power rates.

Without expansion of the Federal system, opportunities for obtaining further electroprocess loads appear to be substantially reduced. Local rates to heavy industrial power users are one to three mills higher than BPA rates. Each local system has the problem of accommodating a large electroprocess load in addition to its normal load, though this problem can be alleviated by pooling of resources. Some local utility systems have announced intentions to serve electroprocess loads (aluminum companies will receive some firm power from PUD constructed projects to replace BPA interruptible power, and the Idaho Power Co. will continue to serve elemental phosphorus loads); other systems have announced that no surplus power will be available (for example, from the Priest Rapids development).

Recent efforts to bring about legal changes more favorable to promotion of a power supply for industrial development include: (1) introduction of Senate Bill 2206 to amend the BPA Act to empower the Bonneville administrator to establish priorities for industrial uses similar to those afforded cooperatives and public agencies; (2) a proposal to establish a regional power corporation with authority to issue its own bonds to replace the "temporary" BPA; and (3) a proposal to establish in the state of Oregon an industrial power marketing agency which would qualify for priority for BPA power as a "public agency."

This paper has pointed out the difficulties of regional planning in a maturing region with a high electric power-load growth in a situation where the principle of governmental hydroelectric generation to stimulate regional development has a limited public acceptance. While it would be worth while to keep under continued study the possibilities of obtaining further electroprocess loads in the Northwest, much greater possibilities of electroprocess industry expansion apparently exist in such relatively underdeveloped regions as British Columbia and Alaska, each with an estimated 15 million kilowatts of undeveloped hydroelectric potential.

[46] Cf. BPA *1956 Advance Program*, Tables 10-12.

[47] See also remarks of Assistant Chief of Engineers for Civil Works, U. S. Army, in *Upper Columbia River Development*, p. 80.

[48] *Ibid.*, p. 157.

[49] PUD No. 2 of Grant County, Washington, *Priest Rapids Hydroelectric Development*, pp. IV-C-19-21, and IV-C-28.

[50] U. S. Federal Power Commission, In the Matter of Idaho Power Co. Projects No. 1971, 2132, 2133. Exhibit 285, Schedule B.

[51] BPA *1949 Advance Program*, p. 13.

CURRENT BUSINESS TRENDS IN OREGON

Banking. Loans, investments, and deposits of Oregon banks that belong to the Federal Reserve System are shown below (in millions of dollars):

	Sept. 25, 1957	*Aug. 28, 1957*	*Sept. 26, 1957*
Loans	792	779	822
Investments	630	646	649
Deposits	1,581	1,604	1,648

Department-Store Sales. The only retail sales indicator for Oregon is the sales of department stores in Portland, a series which is computed by the Federal Reserve Bank of San Francisco. The percentage of dollar sales volume for the period ending October 5, 1957, as compared with the same period a year ago, for Portland and other Pacific Coast cities is shown below:

	Week Ending Oct. 5, 1957	*Four Weeks Ending Oct. 5, 1957*	*Calendar Year to Oct. 5, 1957*
Portland	0	−11	−3
Los Angeles	−6	+ 3	+1
San Francisco Bay	−1	+ 1	−1
Seattle	+4	− 6	0
United States	0	− 1	+2

Electric Energy. During August 1957, kilowatt hours of electricity sold by privately owned electric utilities in Oregon were 12.1 per cent over sales in August 1957. During the twelve months ending August 31, 1957, sales were 9.0 per cent over the twelve-month period ending a year earlier.

Index of Man Hours in Manufacturing. One of the best indicators showing changes in manufacturing activity is the man hours of industrial production workers. These figures apply only to personnel engaged in direct manufacturing activities; sales, office, and general administrative employees are excluded. The index is derived by the Bureau of Business Research from data supplied by the Oregon Unemployment Compensation Commission. The most recent reading covers the month of September 1957. (No adjustment for seasonal variation has been made. 1951 = 100.)

	1956	*1957*		*1956*	*1957*
Jan.	84.1	78.6	July	107.3	95.4
Feb.	84.2	78.9	Aug.	113.6	101.8
Mar.	84.1	78.8	Sept.	108.7	92.0
April	93.4	85.0	Oct.	99.8	----
May	96.6	92.2	Nov.	91.7	----
June	107.1	99.8	Dec.	84.1	----

CURRENT BUSINESS TRENDS IN OREGON

Employment. The figures in the table below cover nonagricultural employment in Oregon. They are supplied by the Oregon State Unemployment Compensation Commission.

	Sept. 1957	*Aug. 1957*	*Sept. 1956*
Lumber & wood products	77,000	80,600	88,000
Food & kindred products	24,500	25,500	25,100
Other manufacturing	46,300	47,000	49,100
Total manufacturing	147,800	153,100	162,200
Contract construction	27,900	27,900	29,200
Retail trade	87,100	86,800	86,100
Government	84,900	79,900	82,000
Other nonmanufacturing	165,200	163,600	164,500
Total nonmanufacturing	365,100	358,200	361,800
Total nonagricultural employment	512,900	511,300	524,000

Business Failures. Dun and Bradstreet's series showing commercial failures is frequently considered an indicator of business health. Figures for Oregon are given below:

	1956		*1957*	
	Number	*Liabilities*	*Number*	*Liabilities*
Jan.	13	$ 421,000	36	$ 908,000
Feb.	7	1,234,000	32	1,252,000
Mar.	13	1,257,000	33	735,000
Apr.	13	604,000	37	1,516,000
May	21	365,000	31	523,000
June	30	593,000	42	1,637,000
July	17	534,000	37	1,465,000
Aug.	10	1,046,000	68	1,024,000
Sept.	22	504,000	56	681,000
Oct.	37	3,202,000	—	—
Nov.	25	674,000	—	—
Dec.	44	882,000	—	—

Lumber. The following data relate to the Douglas fir area of the Pacific Northwest. The figures, which are in thousands of feet, board measure, were supplied by the West Coast Lumbermen's Association.

	Sept. 1957	*Aug. 1957*	*Sept. 1956*
Average weekly production	153,692	160,034	181,058
Average weekly orders	146,088	146,270	164,277
Unfilled orders, end of month	516,204	545,873	554,132
Lumber inventory, end of month	1,013,291	1,011,021	1,016,313

Multnomah County Real-Estate Transactions. During September 1957 there were 971 real-estate sales amounting to $10,482,307 in Multnomah County. Of these, 723 involved residences, the sales price of which was $7,626,445; 181 were vacant properties, $735,972; and 67 were business properties, $2,119,890. Additional figures are:

	Sept. 1957	*Aug. 1957*	*Sept. 1956*
Number of sales	971	996	971
Value of sales	$10,482,307	$10,637,831	$10,048,795
Number of mortgages	754	912	836
Amount loaned	$7,985,711	$10,727,233	$7,132,266
Number of sheriff's deeds	2	3	4
Amount of sheriff's deeds	$ 9,691	$13,110	$13,892
Average residential selling price	$10,548	$10,381	$10,121

Life-Insurance Sales. During August 1957 sales of ordinary life insurance in Oregon (excluding industrial life insurance, group and wholesale sales under new contract, renewals, dividend additions, etc.) were 0.8 per cent ($265,000) lower than in July, 1957 and 5 per cent higher than in August 1956. The national figures showed a 0.3 per cent decrease in comparison with July 1957 and a 27 per cent increase in comparison with August 1956.

BANK DEBITS

Bank debits represent the dollar value of checks drawn against the deposit accounts of individuals and business firms. Bank debits are regarded as good indicators of current business activity, although their value for this purpose may be impaired by the inclusion of large checks arising out of transfers of funds for the purchase of certain types of capital assets that do not constitute "business activity." The Bureau of Business Research collects bank debits from 166 banks and branches monthly.

Economic Areas	*Number of Banks Reporting*	*Debits Sept. 1957*	*Debits Aug. 1957*	*Debits Sept. 1956*	*Sept. 1957 Compared with Aug. 1957*	*Sept. 1957 Compared with Sept. 1956*
Oregon	166	$1,651,680,940	$1,781,041,228	$1,684,102,510	— 7.3	— 1.9
Portland area (Multnomah, Clackamas, Columbia, Washington counties)	53	1,041,258,557	1,130,619,628	1,042,007,272	— 7.9	— 0.1
Mid-Willamette Valley (Benton, Linn, Marion, Polk, Yamhill counties)	35	190,345,562	199,006,525	181,538,968	— 4.4	+ 4.8
North Oregon Coast (Clatsop, Lincoln, Tillamook counties	10	33,291,326	35,872,541	34,516,913	— 7.2	— 3.6
West Central Oregon (Douglas, Lane, Coos counties)	18	141,413,530	157,447,093	158,719,324	—10.2	—10.9
Southwestern Oregon (Curry, Jackson, Josephine counties)	11	70,022,080	75,748,901	81,197,127	— 7.6	—13.8
Upper Columbia River (Gilliam, Wheeler, Hood River counties)	9	28,423,871	29,778,623	33,709,965	— 4.6	—15.7
Pendleton area (Umatilla, Morrow counties)	8	36,157,344	42,117,971	36,933,703	—14.2	— 2.1
Central Oregon (Deschutes, Crook, Jefferson counties)	5	26,763,135	26,360,338	27,084,089	+ 1.5	— 1.2
Klamath Falls area (Klamath, Lake counties)	5	36,897,191	34,654,226	40,159,079	+ 6.5	— 8.1
Baker area (Baker, Wallowa, Grant, Union counties)	8	27,194,273	27,961,626	27,977,963	— 2.8	— 2.8
Burns area (Harney, Malheur counties)	5	19,914,071	21,473,756	20,258,107	— 7.3	— 1.7

BUILDING PERMITS

Building permits give an indication of building operations planned rather than actual construction under way. Care must be taken in interpreting these data to allow for the lag which may elapse between the issuance of the permit and the beginning of actual construction. The data have been collected by the Bureau of Business Research.

	New Residential Sept. 1957	*New Non-residential Sept. 1957*	*Additions, Alterations & Repairs Sept. 1957*	*Totals Sept. 1957*	*Totals Aug. 1957*	*Totals Sept. 1956*
Albany	$ 16,000	$ 23,100	$ 50,600	$ 89,700	$ 121,500	$ 245,480
Baker	40,600	900	13,315	54,815	145,935	57,240
Bend	52,500	49,883	31,005	133,388	84,874	75,034
Coos Bay	39,250	1,000	10,565	50,815	183,220	67,680
Corvallis	34,000	39,900	26,285	100,185	348,405	447,957
Eugene	223,600	47,569	192,675	463,844	407,984	1,019,695
Grants Pass	38,100	27,875	6,975	72,950	25,420	129,390
Hillsboro	79,000	8,790	12,450	100,240	58,015	129,340
Klamath Falls	158,879	10,000	22,782	191,661	285,172	132,816
La Grande	32,600	920,000	5,550	958,150	435,155	5,200
McMinnville	57,600	750	9,950	68,300	27,700	64,975
Medford	104,000	87,119	36,300	227,419	196,640	263,042
North Bend	.....	.....	9,950	9,950	233,359	360,874
Pendleton	10,000	.....	10,285	20,285	73,765	118,100
Portland	1,279,340	1,293,715	1,411,760	3,984,815	4,143,105	2,207,335
Roseburg	16,500	14,949	18,840	50,289	55,840	710,125
Salem	141,450	131,575	198,610	471,635	812,126	405,154
Springfield	16,000	125,000	14,810	155,810	59,875	78,809
The Dalles	.....	88,258	4,950	93,208	26,700	72,458
Lane County	308,747	370,350	61,926	741,023	1,790,704	2,176,946
Multnomah County	990,500	1,165,850	77,120	2,233,470	1,690,360	5,261,285
Wasco County	12,000	2,000	.....	14,000	29,800	11,500
46 other communities	582,780	798,119	260,012	1,641,211	2,092,594	1,412,480
Total	$1,233,446	$5,207,002	$2,489,715	$11,930,163	$13,328,248	$15,452,915